Worksheet 3 Programming paradigms

Task 1

1. Procedural languages were the first type of high level programming language to be developed in the 1950s-60s.

   Do some research to find out when and why each of the languages shown in the table on the next two pages was developed, and fill in the table.

   Tip: Look up on the Internet “History of programming languages”. There are some good PowerPoint presentations on the subject.

2. Can you find the name of a language that is designed to support concurrency (many processes running in parallel)?

3. What languages are used for web programming?

Language	Type	Developed/ released	Main usage	Brief description
ALGOL	Procedural/ imperative	1960		
FORTRAN				
COBOL				
BASIC				
C				

C++				
SQL				
Java				
Haskell				

Task 2

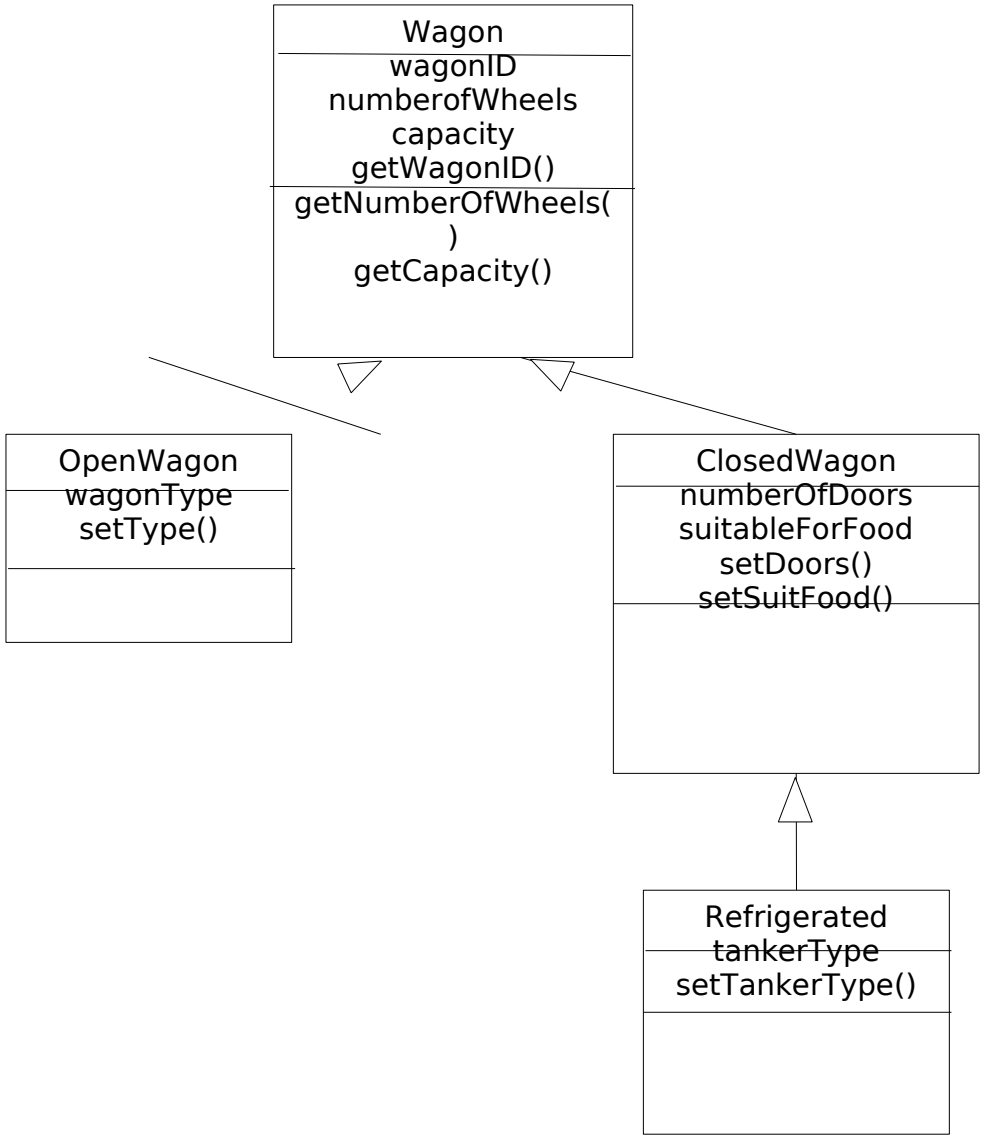
4. Fill in the table to compare the two programming paradigms

Paradigm: Procedural	**Paradigm: Declarative**
The statements generally have to be written in a particular sequence	
	The programmer states the facts and rules associated with the problem
The programmer defines the steps that need to be taken to solve the problem	
	The program will try one route through the facts and rules and if that does not produce an answer, it will _____ and try another route until the problem is solved or _____ _____
Suitable for a wide variety of problems	
Examples of this paradigm are _____	Examples of this paradigm are _____

Task 3

5. An example of an inheritance diagram is shown below.

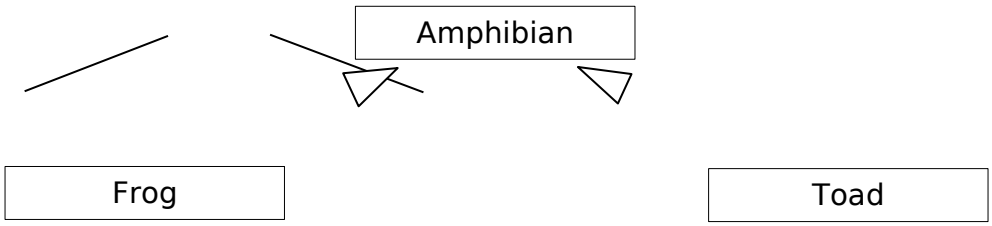
(Note: a wagon is a “car” or “truck” used for carrying freight by rail.)



(a) What programming paradigm uses classes and objects?

(b) Using the diagram above, explain the terms class, method, attribute, inheritance and encapsulation

6. Shown below is an inheritance diagram.



Amphibian has an attribute `position` and a method `jump`.

When an object in the `Frog` class calls the method `jump`, position is incremented by 3, but when in the `toad` class calls the method `jump`, position is incremented by 1.

Explain how this can be implemented.

What is the name given to a programming language's ability to process objects differently depending on their class?